

NATIONAL TRANSPORTATION SAFETY BOARD

Office of Aviation Safety
Washington, D.C. 20594

April 13, 2006

GROUP CHAIRMAN'S FACTUAL REPORT

OPERATIONS GROUP

DCA06MA022

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A. ACCIDENT

Accident Number: DCA06MA022
Operator: United Parcel Service Company
Location: Philadelphia International Airport (PHL), Philadelphia, PA
Date: February 7, 2006
Time: 2359 Eastern Standard Time (est)
Airplane: DC-8-71F, N748UP

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C. SUMMARY

On February 7, 2006, at 2359 eastern standard time, a Douglas DC-8-71F, N748UP, operated by United Parcel Service Company (UPS) as flight 1307, landed at Philadelphia International Airport (PHL), Philadelphia, Pennsylvania, after the crew reported a cargo smoke indication. The three flight crewmembers were able to evacuate the airplane using the L1 slide. Fire subsequently caused substantial damage to the airplane and numerous cargo containers on board. The three crewmembers received minor injuries. Night visual meteorological conditions prevailed and an instrument flight rules flight plan had been filed for the flight from Hartsfield-Jackson Atlanta International Airport (ATL), Atlanta, Georgia, to PHL. The scheduled cargo flight was conducted under 14 CFR Part 121.

D. DETAILS OF THE INVESTIGATION

The NTSB Operations Group members arrived at Philadelphia, Pennsylvania, on February 8, 2006, to begin the field phase of the accident investigation. The NTSB team immediately went to PHL to view the accident airplane.

On February 9, 2006, interviews were conducted by the Operations Group with the three crewmembers on board the accident flight. Also, contents of the two flight bags left on board the accident airplane were inventoried.

On February 10, 2006, the Operations Group observed the flight engineer's oxygen mask and hose to determine if there was sufficient length to reach the emergency cabin air shutoff valve handle¹ next to the courier seats.

Manuals and documents were obtained from United Parcel Service Company and the Federal Aviation Administration (FAA).

The Operations Group concluded the field phase of the accident investigation at 2130 on February 10, 2006.

¹ See Attachment 7-2.

1.0 HISTORY OF FLIGHT

In an interview conducted by the Operations Group, the captain stated that the flight from ATL to PHL was totally uneventful en route until the beginning of the descent into PHL. That is when the first officer asked the rest of the flight crew if they smelled an odor. No smoke was observed at that time but the captain asked the flight engineer to go back to the courier area² to look for smoke and the origin of the odor. In an interview conducted by the Operations Group, the flight engineer stated that he pulled back the smoke curtain³ and shined a flashlight along the left⁴ wall of the upper cargo deck. He could smell the odor but there were no fumes. He sealed the smoke curtain and returned to the cockpit and accomplished the fume evacuation procedure.⁵ He turned on the "Winnebago" [Supplemental Cockpit Climate Control System] fan. He rechecked the cargo area and determined that the odor was stronger in the courier area aft of the cockpit but it was still not burning his eyes.

While the flight engineer was checking for smoke, the captain reviewed the pack smoke procedures⁶ in the Quick Reference Handbook (QRH), which called for turning off various items. After doing some troubleshooting, the flight crew still could not determine the source of the odor.

About this time, the flight was in the vicinity of Washington, D.C. The captain stated that he considered diverting to another airport but since the odor began to dissipate, he elected to continue the flight to PHL. There was no evidence of a problem (such as the illumination of a smoke detector light) and they were already in the descent for PHL. Further, he stated that one other reason of why not to divert to an airport in the Washington, D.C. area was because of the security concerns of landing at one of those airports.

The first officer was the pilot flying. The first officer stated that he increased airspeed about 15 knots in response to the situation with the odor, but they had a 100-knot tailwind and were making good time anyway. He stated that they did not perceive the odor as a threat; therefore, it was not worth overreacting to the situation. The odor totally went away during the descent.

Approaching PHL, the flight was vectored south of the airport for a left downwind entry to the traffic pattern. According to the captain, as the flight leveled off at 4,000 feet in the descent, the odor became stronger, and simultaneously the smoke warning light came on. He commented to the rest of the flight crew that it looked like they had an actual fire, and instructed the flight engineer to perform the QRH procedures by himself because they

² The area next to the L1 cabin entrance door immediately aft of the cockpit and forward of the main upper cargo deck. There are two passenger (courier) seats installed along the wall on the right side of the airplane in the courier area.

³ The smoke curtain is a ventilation barrier that covers the cargo barrier net, which is located between the courier area and the main upper cargo deck.

⁴ Reference facing toward the front of the airplane.

⁵ See Attachments 3-13 and 4-5.

⁶ See Attachment 4-1.

were going to be landing soon.

The flight was about 10 miles from the airport at this time and had just been handed off to Tower. The captain recalled that the approach controller initially cleared the flight for a visual approach to runway 27R and Tower originally cleared the flight to land on runway 27R.

The captain then radioed to Tower that they had a fire [smoke] light and to have the emergency equipment meet the flight upon landing. When Tower transmitted a reply, the emergency alarm could be heard in the background. The captain then instructed the first officer to fly direct to airport.

Tower then cleared the flight to land on runway 27L. Shortly thereafter Tower questioned if they were lined up for runway 27L. The captain stated that he told Tower that he thought they were cleared to land on runway 27R and asked if they were cleared to land on runway 27R. Tower then cleared the flight to land on runway 27R.

In an interview conducted by the Operations Group, the flight engineer stated that between 5,000 feet and 3,000 feet altitude, the upper cargo deck smoke detector illuminated. The cargo smoke and fire checklist was accomplished. Some smoke appeared on the first officer's side of the cockpit and as the airplane got closer to the runway, the lower cargo fire warning light illuminated along with the illumination of the Master Warning light on the first officer's glareshield. He advised the other crewmembers that there was a fire in the lower cargo compartment. They all donned their oxygen masks but none of the crewmembers donned their smoke goggles. In an interview conducted by the Operations Group, the first officer stated that there was no time to don the goggles.

In an interview conducted by the Operations Group, the captain stated that after the lower cargo fire warning light illuminated, the captain's electronic flight instrument system (EFIS) failed. There was power to the EFIS displays but no information was displayed. The airplane was configured for landing, and the captain conducted the landing checklist by himself.

On short final, the amount of smoke increased. The flight engineer stated that he continued to run the checklist. He then went back to the courier area and closed the cabin air shutoff valve. When he opened the door of the access panel to the cabin air shutoff valve, black smoke billowed out of the access panel. He returned to the cockpit and closed the louver in the cockpit door. He sat down in his seat as the captain was making the 500-foot altitude callout. During the landing rollout, the smoke became very dense.

In an interview conducted by the Operations Group, the first officer stated that during the landing rollout, the thrust reversers deployed normally. As the airplane decelerated and as transition of airplane control to the captain was accomplished, heavy smoke pushed forward. In an interview conducted by the Operations Group, the captain stated that once the airplane came to a stop, he set the parking brake, opened his window, and began the evacuation procedures. He tried to get a breath of fresh air out the window

but inhaled smoke instead. About this time, he heard the evacuation slide at the main cabin entrance door deploy.

The flight engineer stated that he turned the battery switch off and took the last breath of oxygen from the oxygen mask and then went back to open the cabin door. He heard the slide go “clunk” and then he reached down and pulled the lanyard to deploy the slide. He went down the slide and then yelled to the other crewmembers that the slide was good.

In an interview conducted by the Operations Group, the first officer stated that when he opened his sliding window, smoke went out the window. He leaned out the window to get fresh air but inhaled smoke, instead. On the radio, he heard Tower talking with the fire truck personnel. The first officer transmitted to Tower, “UPS flight evacuating aircraft.”

The captain reached back to find the escape tape, grabbed it, and threw it out the window. He had initially planned to use the escape tape to evacuate the airplane but decided to use the slide because he wanted to make sure the first officer got out of the airplane.

The first officer stated that he shut off all four fuel control levers and pulled all four fire handles. He heard the flight engineer say, “battery switch off” and then the emergency evacuation checklist was accomplished. He reached for the escape tape access cover but could not locate it. The smoke was so heavy that he could not see his hand in front of him. He grabbed his flashlight, cell phone and, reached behind the captain’s seat for the HAZMAT Envelope,⁷ but it was not there. The first officer stated that he thought the captain had already evacuated.

In an interview conducted by the Operations Group, the captain stated that there may have been an issue with the size of the first officer relative to the size of the window. The captain observed the first officer getting out of his seat. Because of the dense smoke, the first officer soon disappeared from view as he headed towards the rear of the cockpit. The first officer stated that he grabbed his coat and went down the slide. He saw the flight engineer at the bottom of the slide but did not see the captain. Black smoke was rolling out the door.

The captain stated that he began to grope around in an attempt to locate the HAZMAT Envelope, but could only locate the Flight Envelope.⁸ In an interview conducted by the Operations Group, the flight engineer stated that en route, the HAZMAT envelope had fallen on the floor. He stated that he picked it up and wedged it in the fire axe sheath on the bulkhead aft of the flight engineer’s station.

The captain stated that he then became concerned about whether or not the first officer got out of the airplane. He immediately exited toward the galley area behind the cockpit, did not see the first officer, and exited the airplane by use of the slide. The Aircraft

⁷ The HAZMAT Envelope includes all of the hazardous material paperwork for the flight.

⁸ The Flight Envelope includes such items as weather, flight plan, fuel slip, etc., for the flight.

Rescue and Fire Fighting (ARFF) personnel were already there. He informed them that there were hazardous materials on board the airplane and that he had not been able to locate the hazardous materials paperwork. He told them that UPS would be able to provide it.

The first officer stated that after they got out of the airplane, he could see smoke billowing out the windows and door. There were no flames and no heat that would be associated with fire, just black smoke.

The flight crewmembers got into an ambulance and were taken to a hospital where they remained most of the night.

2.0 WEATHER

The following METAR⁹ for PHL was issued on February 7, 2006, at 2254 (about an hour and five minutes before the accident): Wind from 300 degrees at 9 knots, visibility 10 statute miles, clear sky, temperature 1 degree Celsius, dew point minus 8 degrees Celsius, with an altimeter setting of 30.05 inches of mercury.

The following METAR for PHL was issued on February 7, 2006, at 2354 (about five minutes before the accident): Wind from 270 degrees at 7 knots, visibility 10 statute miles, clear sky, temperature 0 degrees Celsius, dew point minus 8 degrees Celsius, with an altimeter setting of 30.06 inches of mercury.

The following METAR for PHL was issued on February 8, 2006, at 0054 (about 55 minutes after the accident): Wind from 300 degrees at 8 knots, visibility 10 statute miles, clear sky, temperature minus 1 degree Celsius, dew point minus 9 degrees Celsius, with an altimeter setting of 30.05 inches of mercury.

⁹ Aviation Routine Weather Report.

3.0 FLIGHT CREW INFORMATION

According to accident flight crew, the three crewmembers had never flown together before this flight pairing, which began on February 6, 2006 (one day before the accident), with the ATL-PHL-ATL flight segments. The flight crew was scheduled to fly the same flight segments on February 7, 8, and 9, and complete the pairing when they returned to ATL on February 10, 2006.

3.0.1 The Captain, Michael J. Higgins

Age: 59

Date of hire with United Parcel Service Company: September 19, 1988

Airman certificates and ratings:

Airline Transport Pilot (issued April 2, 1982)

Airplane Multiengine Land

Type Ratings: DC-8

Commercial Privileges - Airplane Single Engine Land

Flight Instructor (Issued November 22, 1978)

Airplane Single and Multiengine

Instrument Airplane

Limitations: Valid only when accompanied by pilot certificate.

Expires November 30, 1980

Ground Instructor (Issued October 17, 1972)

Advanced Ground Instructor

Instrument Ground Instructor

Medical certificate:

First Class (issued February 3, 2006)

Limitations: Must Wear Corrective Lenses

A search of FAA and company records revealed no history of FAA enforcement actions, incidents, accidents, or company disciplinary actions for the captain.

A review of FAA airman records indicated the following chronology of acquired airman certificates:

AIRMAN CERTIFICATE	ORIGINAL ISSUE DATE
Private Pilot – Airplane Single Engine Land	August 2, 1970
Private Pilot – Instrument	August 28, 1971
Commercial Pilot – Airplane Single Engine Land	November 28, 1971
Commercial Pilot – Airplane Multiengine Land	March 4, 1972
Flight Instructor – Airplane Single Engine	May 11, 1972
Ground Instructor	October 17, 1972
Flight Instructor – Instrument Airplane	August 17, 1973
Airline Transport Pilot – Airplane Multiengine Land	November 7, 1974
Flight Instructor – Airplane Multiengine	April 10, 1975
DC-8 Type Rating	April 2, 1982

Flight experience according to the pilot and United Parcel Service Company records:

FLIGHT TIME	HOURS
Total	25,000
Total PIC (Pilot-in-Command) DC-8	16,000
Last 24 hours	4
Last 7 days	5.5
Last 30 days	5.5
Last 90 days	41
Last 12 months	344

Training and checks:

TRAINING / CHECK	DATE
Initial DC-8 type rating	April 2, 1982
Last DC-8 Recurrent Ground Training	September 8, 2005
Last DC-8 Proficiency Check	September 8, 2005
Last DC-8 Line Check	July 21, 2005

According to an interview conducted by the Operations Group, Captain Higgins stated that he began his professional flight career as a flight instructor, soon moving on to charter work. He then flew for Allegheny Commuter for five to six years. Then he flew for Wright Airlines, flying Convairs in Cleveland, Ohio. From there he flew a Learjet as a corporate pilot for Dana Corporation in Toledo, Ohio. In 1979, he was hired by Evergreen Airways, flying DC-8's, and afterwards, flew DC-8's for United Air Carriers in Saudi Arabia before returning to Evergreen.

3.0.2 The First Officer, Jess W. Grigg

Age: 40

Date of hire with United Parcel Service Company: February 19, 1996

Airman certificates and ratings:

Airline Transport Pilot (issued January 4, 2006)

Airplane Multiengine Land

Type Ratings: BA-3100

DC-8

Limitations: DC-8 Circling Approaches – VMC Only

DC-8 SIC Privileges Only

Commercial Privileges – Airplane Single Engine Land

Ground Instructor (Issued January 5, 1989)

Instrument

Flight Engineer (Issued April 3, 1996)

Turbojet Powered

Medical certificate:

First Class (issued February 1, 2006)

Limitations: None

A review of FAA records indicated no history of failures or re-tests for FAA airman certificates and ratings.

A search of FAA and company records revealed no history of FAA enforcement actions, incidents, accidents, or company disciplinary actions for the first officer.

A review of FAA airman records indicated the following chronology of acquired airman certificates:

AIRMAN CERTIFICATE	ORIGINAL ISSUE DATE
Private Pilot – Airplane Single Engine Land	May 23, 1985
Private Pilot – Instrument	December 18, 1987
Commercial Pilot – Airplane Single Engine Land	December 18, 1987
Commercial Pilot – Multiengine Land	March 7, 1988
Flight Instructor – Airplane Single Engine	April 27, 1988
Flight Instructor – Instrument	June 25, 1988
Ground Instructor	January 5, 1989
Flight Instructor – Multiengine	April 27, 1990
Airline Transport Pilot – Airplane Multiengine Land	July 31, 1994
BA-3100 Type Rating	July 31, 1994
Flight Engineer – Turbojet Powered	April 3, 1996

Flight experience according to the pilot and United Parcel Service Company records:

FLIGHT TIME	HOURS
Total	7,500
Total SIC (Second-in-Command) DC-8	2,100
Last 24 hours	4
Last 7 days	5.5
Last 30 days	5.5
Last 90 days	5.5
Last 12 months	137

Training and checks:

TRAINING / CHECK	DATE
Last DC-8 Recurrent Ground Training	January 6, 2006
Last DC-8 Proficiency Check	January 6, 2006
Last DC-8 Line Check	April 16, 1998

According to an interview conducted by the Operations Group, after completing flight training at Louisiana Technical University, he became a flight instructor at the Acme School of Aeronautics in Fort Worth, Texas. He then worked as pilot for a charter company, Alpha-Century Corporation, in Fort Worth, Texas, flying King Airs until April 1991. From 1991 to 1995, he flew for the commuter airline, Express Airlines I (now called Pinnacle Airlines).

3.0.3 The Second Officer (Flight Engineer), Joseph J. Chvatal

Age: 61

Date of hire with United Parcel Service Company: January 24, 1994

Airman certificates and ratings:

Airline Transport Pilot (issued March 29, 2002)

Airplane Multiengine Land

Type Ratings: B-737

B-757

B-767

Commercial Privileges – Airplane Single Engine Land

Flight Engineer (Issued May 23, 1990)

Turbojet Powered

Medical certificate:

Second Class (issued March 15, 2005)

Limitations: None

A review of FAA records indicated no history of failures or re-tests for FAA pilot certificates and ratings.

A search of FAA and company records revealed no history of FAA enforcement actions, incidents, accidents, or company disciplinary actions for the second officer.

A review of FAA airman records indicated the following chronology of acquired airman certificates:

AIRMAN CERTIFICATE	ORIGINAL ISSUE DATE
Private Pilot – Airplane Single Engine Land	May 4, 1966
Commercial Pilot – Airplane Single Engine Land*	May 23, 1968
Commercial Pilot – Multiengine Land Limited to Center Thrust*	May 23, 1968
Commercial Pilot – Instrument Airplane*	May 23, 1968
Flight Engineer – Turbojet Powered	May 23, 1990
Airline Transport Pilot – Airplane Multiengine Land	February 23, 1990
B-737 Type Rating	November 24, 1992
B-757 Type Rating	March 29, 2002
B-767 Type Rating	March 29, 2002

* Issued based on military competence

Flight experience according to the pilot and United Parcel Service Company records:

FLIGHT TIME	HOURS
Total	9,000
Total Flight Engineer	2,000
Total Flight Engineer DC-8	430
Last 24 hours	4
Last 7 days	5.5
Last 30 days	43
Last 90 days	63
Last 12 months	289

Training and checks:

TRAINING / CHECK	DATE
Last DC-8 Recurrent Ground Training	June 4, 2005
Last DC-8 Proficiency Check	June 4, 2005
Last DC-8 Line Check	August 17, 2004

According to an interview conducted by the Operations Group, Mr. Chvatal stated that he is an ex-military pilot who flew F-4s, A-7s and A-10s in the United States Air Force. After leaving the United States Air Force, he was employed by Trans World Airlines for about a year as a flight engineer on the B-747. He was then employed by America West Airlines as a B-747 flight engineer before coming to United Parcel Service Company.

4.0 AIRPLANE INFORMATION

4.0.1 Weights, Configuration, and Speeds

AIRPLANE WEIGHTS	
	WEIGHT (Pounds)
Basic Operating Weight	152,700
Baggage/Cargo Weight (Shown on Form)	58,312
Zero Fuel Weight	211,012
Maximum Zero Fuel Weight*	245,000
Fuel Weight	36,300
Ramp Weight	247,312
Maximum Ramp Weight*	331,000
Taxi Fuel Burn	2200
Takeoff Gross Weight	245,112
Maximum Takeoff Weight*	328,000
Estimated Fuel Burn to Accident Site**	15,526
Estimated Landing Weight**	229,586
Maximum Landing Weight*	258,000

* Manufacturer's Airplane Flight Manual limitation

**Based on FL 33,000, the actual en route flight altitude

CONFIGURATION AND SPEEDS	
Landing Flaps	Flaps Full (50 degrees)
V _{REF}	139 KIAS ¹⁰
V _{AP}	152 KIAS

4.0.2 General Emergency Guidance

According to the UPS DC-8 Aircraft Operating Manual, when formulating a course of action during an emergency situation, there is no substitute for good judgment and a thorough analysis of all conditions and variables. It further states that because of the complexity of these variables, it is not possible to list them all in this document; however, these three steps, in the order of priority listed, will generally apply to all emergency situations:

- Maintain aircraft control
- Analyze the situation and take proper action
- Land as soon as practicable

¹⁰ Indicated airspeed in knots.

4.0.3 Checklist Procedures

According to the UPS DC-8 Aircraft Operating Manual, successful handling of emergencies is largely dependent on proper cockpit resource management under the leadership of the captain. The captain must provide clear direction during any emergency or abnormal situation. When an emergency or abnormal condition is identified, the pilot flying (PF) initially determines the exact nature of the problem and calls for a specific emergency or abnormal checklist. In the event the first officer is PF when a malfunction occurs, decisions regarding which checklist to accomplish, and the designation of PF and pilot monitoring (PM), are always subject to final determination by the captain. As pilot-in-command the captain has ultimate responsibility, and authority, with regard to the operation and safety of the aircraft and crew.

It further states in the UPS DC-8 Aircraft Operating Manual that the overriding matter of importance at all times is very basic: **SOMEONE MUST FLY THE AIRCRAFT**. The PF devotes his entire awareness to the control and navigation of the airplane with regard to terrain, weather, air traffic control and aircraft configuration. The PM retains his usual cockpit duties, as well as ensuring all checklist items are accomplished.

According to the UPS DC-8 Aircraft Operating Manual, there are at least four procedures dealing with onboard fumes smoke, and fire: Pack Smoke, Smoke of Unknown Origin or Suspected Electrical Fire, Lower and/or Main Cargo Compartment Smoke or Fire, and Fumes Evacuation. The following is an overview of these procedures:

4.0.3.1 Pack Smoke

According to the UPS DC-8 Aircraft Operating Manual,¹¹ smoke entering the cockpit through air conditioning ducts can generally be attributed to either (a) one of the engines (source of bleed air for air conditioning/pressurization), (b) one of the packs (conditions the bleed air and routes it to the cockpit), or (c) the air conditioning ducting. Specifically, a bad engine seal may allow oil smoke into the bleed air supply from the engine, a faulty pack bearing may introduce smoke into the ducting, or the air conditioning ducting itself may overheat and produce smoke. In any of these cases, this procedure attempts to identify the offending pack or engine and then either turn it off or cut-off its bleed air output. After turning off a pack, it is necessary to wait approximately 30 to 60 seconds to see if the smoke clears. Throughout this procedure, flow on the operative pack must be adjusted as needed to maintain air conditioning/pressurization.

The first few steps in the procedure are as follows:

- RECIRC FANOFF
- PNEUMATIC CROSS FEED VALVECLOSE
- LEFT PACK.....OFF

¹¹ See Attachments 3-6 and 4-1 for.

The Recirc Fan will spread the smoke throughout the cockpit. Closing the pneumatic crossfeed valve will assist in isolating the source of the smoke. Whether in flight or on the ground, placing the pneumatic crossfeed valve switch to CLOSE will ensure the valve is closed.

The procedure continues with additional steps to identify the offending pack or engine.

4.0.3.2 Smoke of Unknown Origin or Suspected Electrical Fire

According to the UPS DC-8 Aircraft Operating Manual,¹² whenever smoke and/or fumes are detected in the aircraft, all crewmembers will don oxygen masks, and ensure the oxygen selector is set to 100%. This must be done as soon as possible to prevent being overcome by toxic smoke and/or fumes. Smoke goggles are required to prevent eye irritation or damage from smoke and/or fumes. Before starting this checklist, all cockpit indications must be checked to ensure that the fire is indeed electrical in nature (or unknown), and not related to another source such as cargo fire, packs, etc. If so, refer to the appropriate checklist. Items to check include, but are not limited to, the following:

- CARGO SMOKE lights
- LOWER CARGO FIRE light
- Cockpit air conditioning outlets

All electrical indications must be thoroughly scanned in an attempt to note any obvious signs of an electrical anomaly (e.g., high load meter reading). When performing this procedure, a pause between each step is needed to determine if the fault is isolated. Observed changes in smoke or electrical load indications determine the location of faulty circuits. Once the fault is determined, the remaining steps in the procedure are not performed after the smoke is eliminated.

The first few steps in the procedure are as follows:

- OXYGEN MASKS & GOGGLESON
- ATCNOTIFY
- LANDAS SOON AS POSSIBLE
- MANUAL PRESSURE CONTROL LEVERLOCKED
- RECIRC FANOFF

The procedure continues with additional steps to isolate the electrical source of the smoke or suspected electrical fire.

¹² See Attachment 3-8.

4.0.3.3 Lower and/or Main Cargo Compartment Smoke or Fire

According to the UPS DC-8 Aircraft Operating Manual,¹³ whenever smoke or fumes are detected in the aircraft, all crewmembers will don oxygen masks (with oxygen selector at 100%) and smoke goggles. This must be done as soon as possible to prevent being overcome by toxic fumes or smoke. Smoke goggles are required to prevent eye irritation or damage from smoke or fumes.

Smoke and/or fire in any of the lower cargo compartments is indicated by the following visual warnings in the cockpit:¹⁴

- The "Lower Cargo Fire" warning light on the F/E panel illuminates
- The "Master Warning" light on the F/O glareshield illuminates
- The "Lower Cargo Fire" warning light on the CDU illuminates
- The CDU alphanumeric display indicates location of the smoke/fire:
 - FWD A - Belly 31
 - FWD B - Belly 32
 - AFT C - Belly 33
 - AFT D - Belly 34

Smoke and/or fire in the main cargo compartment is indicated by illumination of the Cargo Smoke light(s) on the Second Officer's upper panel.

The initial steps in the procedure are as follows:

- OXYGEN MASKS & GOGGLES ON
- PACKS 1 OFF, 1 ON MINIMUM FLOW
- RECIRC FAN OFF
- OVERHEAD AIR DIFFUSER VALVES OPEN
- MAIN CARGO AIR SHUTOFF VALVE CLOSED¹⁵
- COCKPIT DOOR & LOUVERS CLOSED
- RADIO RACK BLOWER SWITCH OFF
- CABIN DIFFERENTIAL PRESSURE MANUALLY SET 0.5 PSI
AND MAINTAIN
- LAND AS SOON AS POSSIBLE

The procedure continues with additional steps to take if an immediate landing is not possible or if cabin altitude exceeds certain limits.

¹³ See Attachment 3-11.

¹⁴ This system provides the crew a visual indication of a fire in any lower cargo compartment. The system consists of 19 Smoke Detector Units located in the ceilings of the lower cargo compartments, a Control Display Unit (CDU) in the cockpit to the right of the flight engineer's station, a Central Control Unit (CCU) in the aft accessory compartment, and a Lower Cargo Fire warning light on the flight engineer's panel. See Attachment 3-19.

¹⁵ On February 10, 2006, the flight engineer's oxygen mask hose on the accident airplane was inspected by the Operations Group. The hose length measured 57 inches from the flight engineer's panel to the oxygen mask. A member of the Operations Group was able to step out of the cockpit and reach the main cargo air shutoff valve while wearing the oxygen mask.

4.0.3.4 Fumes Evacuation

According to the Fumes Evacuation checklist¹⁶ in the UPS DC-8 Aircraft Operating Manual, all crewmembers will don oxygen masks with oxygen selector levers set to 100% and ON. Don smoke goggles.

The steps in the procedure are as follows:

- OXYGEN MASKS & GOGGLESON
- PACKSON, MAX FLOW
- RECIRC FANOFF
- COCKPIT DOOR AND LOUVERS..... CLOSED
- ALL COCKPIT AIR OUTLETS.....FULL OPEN
- DESCEND TO 10,000' OR MEA IF HIGHERINITIATE
- CABIN ALTITUDE.....MAINTAIN
- LANDAS SOON AS
POSSIBLE¹⁷
- EVACUATE AIRCRAFT(AS REQUIRED)

Maximum pack airflow provides maximum airflow through the aircraft to reduce the concentration of fumes. The Recirc Fan is turned off to prevent fumes being introduced into air distribution ducts and contaminating flow of fresh pack air. The cockpit door and louvers are closed to create a barrier between the flight station and the cargo compartment. Airflow will move toward the tail of the aircraft, reducing fumes in the cockpit. All cockpit air outlets are full open to provide maximum airflow through the cockpit. The descent to 10,000 feet (or MEA, if higher) begins to reduce cabin differential pressure. Manually maintaining cabin altitude at existing altitude reduces cabin differential pressure. Increasing cabin differential will reduce airflow through the aircraft and may increase fume concentration. Higher cabin altitude may increase evaporation or aggravate leakage of the substance causing fumes. If an emergency evacuation is required, using cockpit side windows should be considered.

¹⁶ See Attachment 3-13.

¹⁷ Additional step in the Fumes Evacuation checklist in the QRH. See Attachments 3-13 and 4-5.

4.0.3.5 Emergency Evacuation

According to the UPS DC-8 Aircraft Operating Manual, the Emergency Evacuation checklist¹⁸ applies during an unplanned (not briefed) evacuation, such as an incident during taxi, rejected takeoff or landing, time is not available for cockpit preparation. If an incident occurs that requires an immediate, unplanned evacuation, the Captain stops the aircraft and calls for the EMERGENCY EVACUATION checklist.

The steps in the procedure are as follows:

- TOWER.....NOTIFY
- PARKING BRAKE.....SET
- FUEL SHUTOFF LEVERSOFF
- FIRE HANDLES.....FULL FORWARD
- FIRE AGENT (IF REQUIRED)DISCHARGE
- BATTERY SWITCH.....OFF
- EMERGENCY EVACUATION.....ACCOMPLISH

The first officer notifies the tower, or appropriate ATC facility, that the crew is evacuating the aircraft, advising the nature of the emergency if time permits. The second officer actuates all Fire Handles full forward and discharges all fire agent bottles, if required. If the cause of the emergency evacuation is clearly not engine-related, then there is no need to discharge the bottles. The second officer turns the Battery Switch OFF after fire bottles are discharged (if applicable).

All crewmembers and ACMs evacuate through the cockpit window exits or forward cabin door. The captain will determine and announce location outside aircraft where crewmembers and ACMs are to meet after the evacuation. The captain, or next senior crewmember will determine if everyone has safely evacuated the aircraft, and report to ground emergency personnel when able.

¹⁸ See Attachment 3-14.

5.0 AIRPORT INFORMATION

Philadelphia International Airport is located about five miles southwest of Philadelphia, Pennsylvania. The airport is served by one set of parallel runways and two non-parallel runways, for a total of four runways. The parallel runways are numbered 9L-27R and 9R-27L. The non-parallel runways are numbered 8-26 and 17-35. The airport elevation is 36 feet mean sea level (MSL).

The active runway for the McDonnell Douglas DC-8-71F, N748UP, on the day of the accident was runway 27R. Runway 27R is served by an Instrument Landing System (ILS). A detailed description of each of the runways is shown in the table on the following page:

5.0.1 PHL Runway Description

Philadelphia International Airport Philadelphia, Pennsylvania

DESCRIPTION	RUNWAY			
	9L	27R	9R	27L
DIMENSIONS (FEET)	9,500 x 150	9,500 x 150	10,506 x 200	10,506 x 200
TOUCHDOWN ZONE ELEVATION (FEET)	13.2	10.6	20.3	9.1
SURFACE	Asphalt/ Grooved	Asphalt/ Grooved	Asphalt/ Grooved	Asphalt/ Grooved
RVR EQUIPMENT	Touchdown	Touchdown	Rollout	Touchdown, Midfield, Rollout
APPROACH LIGHTS	MALSR ¹⁹	MALSR	ALSF2 ²⁰	MALSR
TOUCHDOWN ZONE LIGHTS	No	No	Yes	No
RUNWAY EDGE LIGHTS	High Intensity	High Intensity	High Intensity	High Intensity
CENTERLINE LIGHTS	Yes	Yes	Yes	Yes
VISUAL APPROACH SLOPE INDICATOR (VASI)	4-Light PAPI ²¹ on Left	No	No	No

DESCRIPTION	RUNWAY			
	8	26	17	35
DIMENSIONS (FEET)	5,000 x 150	5,000 x 150	5,460 x 150	5,460 x 150
TOUCHDOWN ZONE ELEVATION (FEET)	9.4	36.1	8.6	8.6
SURFACE	Asphalt/ Grooved	Asphalt/ Grooved	Asphalt/ Grooved	Asphalt/ Grooved
RVR EQUIPMENT	Touchdown, Rollout	Touchdown, Rollout	Touchdown	Touchdown
APPROACH LIGHTS	No	MALSR	MALSR	No
TOUCHDOWN ZONE LIGHTS	No	No	No	No
RUNWAY EDGE LIGHTS	High Intensity	High Intensity	High Intensity	High Intensity
CENTERLINE LIGHTS	Yes	Yes	No	No
VISUAL APPROACH SLOPE INDICATOR (VASI)	No	4-Light PAPI on Right	4-Light PAPI on Left	4-Box VASI ²² on Left

¹⁹ Medium Intensity Approach Lighting System with Runway Alignment Indicator Lights.

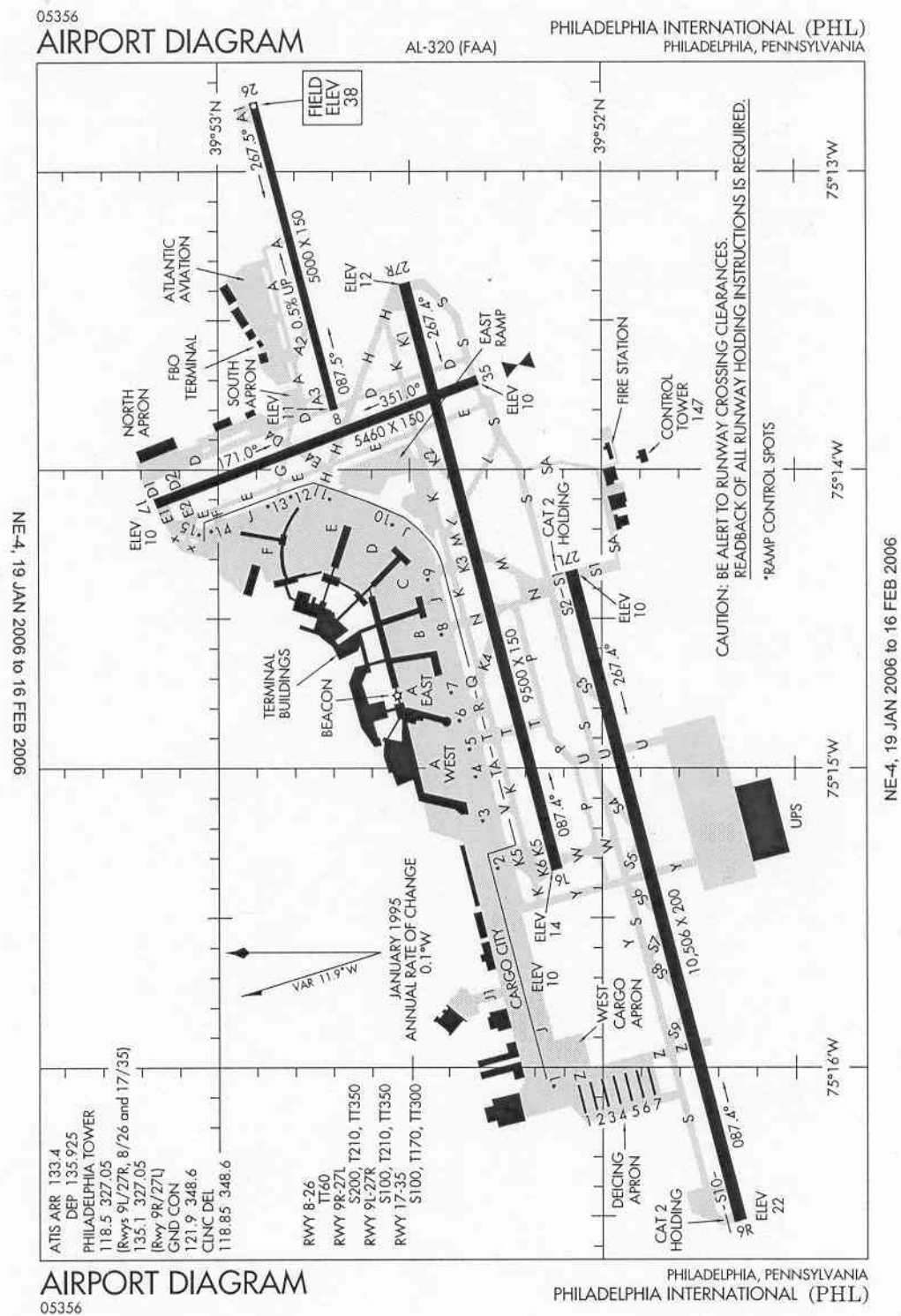
²⁰ Standard 2400 feet high-intensity approach lighting system with sequenced flashers (CAT II configuration).

²¹ Precision Approach Path Indicator.

²² Visual Approach Slope Indicator.

5.0.2 PHL Airport Diagram

NOT TO BE USED FOR NAVIGATION



6.0 THE COMPANY

The United Parcel Service Company was founded in 1907 as a messenger company in the United States. Today, UPS has become a global package delivery service company in more than 200 countries and territories worldwide. The corporate offices are located in Atlanta, Georgia, and the company airline is based in Louisville, Kentucky. UPS employs about 400,000 people worldwide.

In 1988, UPS received authorization from the FAA to operate its own airplanes, thereby officially becoming an airline. The company currently operates 268 airplanes²³ consisting of 49 A-300s, 32 B-727s, 11 B-747s, 75 B-757s, 32 B-767s, 47 DC-8s, and 22 MD-11s. There are three flight crew bases located in Louisville, Kentucky, Miami, Florida, and Ontario, California.

7.0 FAA OVERSIGHT

The United Parcel Service Company Operating Certificate has been managed by the FAA at the Louisville Flight Standards District Office (FSDO) in Louisville, Kentucky since January 25, 1988.

A review of the FAA's Program Tracking and Reporting Subsystem (PTRS) revealed that the accident captain was ramp checked by the FAA four times between September 1, 1998, and March 3, 2006 (status: closed; results: satisfactory).

A review of the FAA's PTRS records revealed that a total of 3053, 2451, and 2084 entries, respectively, were made for Fiscal Years 2004, 2005, and 2006 (through March 3, 2006) in the following areas of Operations activities at United Parcel Service Company: Airmen Certification (1500 series), Surveillance (1600 series), and Investigations (1700 series).

²³ This total includes the accident airplane.

E. LIST OF ATTACHMENTS

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Michael J. Higgins, United Parcel Service Company, DC-8 Captain	1-1
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